



Federal Emergency Management Agency

Region X

Federal Regional Center

Bothell, Washington 98021-9796

MEMORANDUM FOR: COMMUNITIES PARTICIPATING IN THE NATIONAL FLOOD
INSURANCE PROGRAM (NFIP)

SUBJECT: DECEMBER 1986 REVISION OF MODEL FLOOD DAMAGE PREVENTION
ORDINANCE

In September 1986 communities participating in the NFIP were notified by FEMA's Washington D.C. Office of the need to revise local ordinances to incorporate new Federal Regulations that went into effect on October 1, 1986. This notice indicated that communities had until April 1, 1987 to incorporate the new provisions in order to retain eligibility in the NFIP.

The last major NFIP regulation change occurred in October 1976. Our office followed with a suggested model ordinance in 1977. There have been minor changes to this model ordinance through the years, but never a major change; such a change is now necessary in view of not only the October 1, 1986 revisions, but also to reflect substantial regulation changes that occurred on October 1, 1984 and January 1, 1986. Attached is a revision to our 1977 model ordinance that incorporates all changes, for use in reviewing your existing ordinance and making appropriate changes.

USE OF MODEL ORDINANCE. As before, the model is not mandatory, but provides a convenient bridge between language in the Federal Regulations and language suitable for local ordinances. Adoption of the ordinance as is will obviously meet all NFIP requirements; but any community may alter the format or language as it sees fit as long as mandatory Regulation requirements are met. The requirements that are mandatory for FEMA approval are denoted throughout with an asterisk(*) .

FORMAT. In this document we have taken an original model and marked it up to show actual changes, since most communities adopted all or portions of our original model ordinance. Thus, additions reflecting new regulation requirements or clarifications are in bold print; language that is superseded is either crossed out with slash marks (////) or denoted by the term "delete"; or both. The exception is Coastal High Hazard Area Attachment 2, which is an entirely new section; changes here were of such a nature that the "cut and paste" method would be difficult to use. We also have straight-typed versions of the model ordinance which can be provided to any community.

MANDATORY SECTIONS. Mandatory sections are those that must be in the ordinance in order for FEMA to approve it (although language can vary). They are denoted in the Outline and throughout the ordinance with an asterisk(*). Note that you do not need to incorporate new requirements denoted by bold face print if your measures are more restrictive. You are encouraged to retain more restrictive standards. An example is the original mobile home anchoring standard [Section 5.1-1(2)]. Also, some of the additions (bold print) merely clarify, and are not mandatory. An example of this is the changed definition of "Area of Shallow Flooding;" however, certain definitions may be required if they are specifically cross-referenced in the ordinance (e.g. the definition of "Development").

ATTACHMENTS/FEDERAL REGULATION SECTIONS 60.3(a), (b), (c), (d) and (e).

We have set up a single model which can be used to cover all circumstances by either adoption of the model, or the model with attachments. The basic ordinance relates to a community participating under Section 60.3(d), which addresses flood elevations and floodways. Following is a summary of the categories of participation, together with what that category means in terms of maps, zones and pertinent model ordinance attachments.

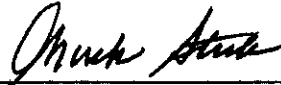
- 60.3(a): A community participating under Section 60.3(a) has no maps, and an ordinance change is not necessary.
- 60.3(b): The community has no flood elevations or floodways, but has flood boundaries and unnumbered A zones on its maps; at least the mandatory (asterisked) provisions of the model ordinance are required, but the Specific Standards at Section 5.2 will normally not apply (unless base flood elevations are available from another source, or are generated).
- 60.3(c): The community has flood elevations but no floodways, and should incorporate the Encroachment Standard referenced in the NOTE following Section 5.3, Floodways, in the last page of the ordinance.
- 60.3(d): The community has flood elevations and floodways. Adoption of the model, as is, will meet all requirements.
- 60.3(e): The community has coastal high hazard areas (V zones) and must incorporate the special construction standards in Attachment 2 in addition to the basic model.
- AO zones: Any (c), (d) and/or (e) community can have AO zones denoting shallow flooding. These zones are depicted by flood depths, not elevations and the community must adopt AO zone standards in Attachment 1 in addition to the basic ordinance.

Any community may have a combination of categories. The model is flexible in that it will accommodate all combinations.

ADMINISTRATIVE PROCEDURES. The regulations specify that an ordinance must be legally enforceable. Many of the non-mandatory measures in the model, though not specifically required for FEMA approval, are administrative provisions aimed at making ordinances legally enforceable and are, therefore, recommended (e.g. the variance provisions, penalties for noncompliance, etc.).

Since failure to make the required changes by April 1, 1987 could lead to suspension from the program, we urge you to respond as quickly as possible. Draft ordinances should be sent to this office or to State Coordinators for review prior to final adoption if there is any question, or if there is a major discrepancy with the model. If assistance is desired, you should contact either the State Coordinating Agency for the NFIP, or this office. Appropriate State and FEMA Regional Office contacts are listed below.

As soon as the ordinance is adopted it should be sent to this office so that it can be reviewed and a formal compliance letter can be sent. We appreciate your cooperation.



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OUTLINE OF FEMA REGION X
MODEL FLOOD DAMAGE PREVENTION ORDINANCE

Revised December 1986

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* Required for Approval by FEMA.

** Only applies to Subsection 4.3-1(2)

. Additions are in Bold Face

. Deletions are ~~crossed out~~ or noted by the term "Delete"

FLOOD DAMAGE PREVENTION ORDINANCE

SECTION 1.0

STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE, AND OBJECTIVES

1.1 STATUTORY AUTHORIZATION

The Legislature of the State of (State) has in (statutes) delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the (governing body) of (local unit) , (State) does ordain as follows:

1.2 FINDINGS OF FACT

- (1) The flood hazard areas of (local unit) are subject to periodic inundation which results in loss of life and property, health, and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.
- (2) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated, or otherwise protected from flood damage also contribute to the flood loss.

1.3 STATEMENT OF PURPOSE

It is the purpose of this ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- (1) To protect human life and health;
- (2) To minimize expenditure of public money and costly flood control projects;
- (3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- (4) To minimize prolonged business interruptions;
- (5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;
- (6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
- (7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and,
- (8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

1.4 METHODS OF REDUCING FLOOD LOSSES

In order to accomplish its purposes, this ordinance includes methods and provisions for:

- (1) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
- (2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- (3) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- (4) Controlling filling, grading, dredging, and other development which may increase flood damage; and
- (5) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or may increase flood hazards in other areas.

* Required for approval by FEMA.

SECTION 2.0 DEFINITIONS

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application.

"APPEAL" means a request for a review of the (local administrator's) interpretation of any provision of this ordinance or a request for a variance.

"AREA OF SHALLOW FLOODING" means a designated AO or AH Zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and, velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.

"AREA OF SPECIAL FLOOD HAZARD" means the land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year. Designation on maps always includes the letters A or V.

"BASE FLOOD" means the flood having a one percent chance of being equalled or exceeded in any given year. Also referred to as the "100-year flood." Designation on maps always includes the letters A or V.

"DEVELOPMENT" means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations located within the area of special flood hazard.

~~**"EXISTING/MOBILE/HOME/PARK/OR/MOBILE/HOME/SUBDIVISION"**~~ (Delete)

~~**"EXPANSION/TO/AN/EXISTING/MOBILE/HOME/PARK/OR/MOBILE/HOME/SUBDIVISION"**~~ (Delete)

"FLOOD" or "FLOODING" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

- (1) The overflow of inland or tidal waters and/or
- (2) The unusual and rapid accumulation of runoff of surface waters from any source.

"FLOOD INSURANCE RATE MAP (FIRM)" means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

"FLOOD INSURANCE STUDY" means the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Boundary-Floodway Map, and the water surface elevation of the base flood.

"FLOODWAY" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

"LOWEST FLOOR" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance found at Section 5.2-1(2).

"MANUFACTURED HOME" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For flood plain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes the term "manufactured home" does not include park trailers, travel trailers, and other similar vehicles.

"MANUFACTURED HOME PARK OR SUBDIVISION" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

~~**"MOBILE/HOME"**~~ (Delete)

"New Construction" means structures for which the "start of construction" commenced on or after the effective date of this ordinance.

~~**"NEW MOBILE/HOME/PARK/OR/MOBILE/HOME/SUBDIVISION"**~~ (Delete)

~~**"START/OF/CONSTRUCTION"**~~ (Delete entirely and replace with the following:)

"START OF CONSTRUCTION" includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundation or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

"STRUCTURE" means a walled and roofed building including a gas or liquid storage tank ~~or~~ ~~that~~ that is principally above ground.

"SUBSTANTIAL IMPROVEMENT" means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either:

- (1) before the improvement or repair is started, or
- (2) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

- (1) any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, or
- (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

"VARIANCE" means a grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by this ordinance.

SECTION 3.0 GENERAL PROVISIONS

3.1 LANDS TO WHICH THIS ORDINANCE APPLIES

This ordinance shall apply to all areas of special flood hazards within the jurisdiction of local unit.

3.2 *BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD

The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for the (local unit)," dated _____, 19____, with accompanying Flood Insurance Maps is hereby adopted by reference and declared to be a part of this ordinance. The Flood Insurance Study is on file at (address).

3.3 PENALTIES FOR NONCOMPLIANCE

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this ordinance and other applicable regulations. Violation of the provisions of this ordinance by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this ordinance or fails to comply with any of its requirements shall upon conviction thereof be fined not more than _____ or imprisoned for not more than _____ days, or both, for each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent the (local unit) from taking such other lawful action as is necessary to prevent or remedy any violation.

3.4 ABROGATION AND GREATER RESTRICTIONS

This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

3.5 INTERPRETATION

In the interpretation and application of this ordinance, all provisions shall be:

- (1) Considered as minimum requirements;
- (2) Liberally construed in favor of the governing body; and,
- (3) Deemed neither to limit nor repeal any other powers granted under State statutes.

3.6 WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of (local unit), any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

SECTION 4.0 ADMINISTRATION

4.1 ESTABLISHMENT OF DEVELOPMENT PERMIT

4.1-1 * Development Permit Required

A development permit shall be obtained before construction or development begins within any area of special flood hazard established in Section 3.2. The permit shall be for all structures including ~~mobile~~ manufactured homes, as set forth in the "DEFINITIONS", and for all development including fill and other activities, also as set forth in the "DEFINITIONS".

4.1-2 Application for Development Permit

Application for a development permit shall be made on forms furnished by the (local administrator) and may include but not be limited to; plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing. Specifically, the following information is required:

- (1) Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures;
- (2) Elevation in relation to mean sea level to which any structure has been floodproofed;
- (3) Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in Section 5.2-2; and
- (4) Description of the extent to which a watercourse will be altered or relocated as a result of proposed development.

4.2 DESIGNATION OF THE (local administrator)

The (local administrator) is hereby appointed to administer and implement this ordinance by granting or denying development permit applications in accordance with its provisions.

4.3 DUTIES AND RESPONSIBILITIES OF THE (local administrator)

Duties of the (local administrator) shall include, but not be limited to:

4.3-1 Permit Review

- (1) Review all development permits to determine that the permit requirements of this ordinance have been satisfied.
- (2) * Review all development permits to determine that all necessary permits have been obtained from those Federal, State, or local governmental agencies from which prior approval is required.
- (3) Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of Section 5.3(1) are met.

4.3-2 * Use of Other Base Flood Data

When base flood elevation data has not been provided in accordance with Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD, the (local administrator) obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, State or other source, in order to administer Sections 5.2, SPECIFIC STANDARDS, and 5.3 FLOODWAYS.

4.3-3 * Information to be Obtained and Maintained

- (1) Where base flood elevation data is provided through the Flood Insurance Study or required as in Section 4.3-2, obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement.
- (2) For all new or substantially improved floodproofed structures:
 - (i) verify and record the actual elevation (in relation to mean sea level), and
 - (ii) maintain the floodproofing certifications required in Section 4.1(3).
- (3) Maintain for public inspection all records pertaining to the provisions of this ordinance.

4.3-4 * Alteration of Watercourses

- (1) Notify adjacent communities and the (State coordinating agency) prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.
- (2) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

4.3-5 Interpretation of FIRM Boundaries

Make interpretations where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 4.4.

4.4 VARIANCE PROCEDURE

4.4-1 Appeal Board

- (1) The (appeal board) as established by (local unit) shall hear and decide appeals and requests for variances from the requirements of this ordinance.
- (2) The (appeal board) shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the (local administrator) in the enforcement or administration of this ordinance.
- (3) Those aggrieved by the decision of the (appeal board), or any taxpayer, may appeal such decision to the (name of appropriate court), as provided in (statute).
- (4) In passing upon such applications, the (appeal board) shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and:
 - (i) the danger that materials may be swept onto other lands to the injury of others;
 - (ii) the danger to life and property due to flooding or erosion damage;
 - (iii) the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
 - (iv) the importance of the services provide by the proposed facility to the community;
 - (v) the necessity to the facility of a waterfront location, where applicable;
 - (vi) the availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
 - (vii) the compatibility of the proposed use with existing and anticipated development;
 - (viii) the relationship of the proposed use to the comprehensive plan and flood plain management program for that area;
 - (ix) the safety of access to the property in times of flood for ordinary and emergency vehicles;
 - (x) the expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and,
 - (xi) the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.
- (5) Upon consideration of the factors of Section 4.4-1(4) and the purposes of this ordinance, the (appeal board) may attach such conditions to the granting of variances as it deems necessary to further the purposes of this ordinance.
- (6) The (local administrator) shall maintain the records of all appeal actions and report any variances to the Federal Insurance Administration upon request.

4.4-2 Conditions for Variances

- (1) Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items (i-xi) in Section 4.4-1(4) have been fully considered. As the lot size increases the technical justification required for issuing the variance increases.
- (2) Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, without regard to the procedures set forth in this section.
- (3) Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.
- (4) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
- (5) Variances shall only be issued upon:
 - (i) a showing of good and sufficient cause;
 - (ii) a determination that failure to grant the variance would result in exceptional hardship to the applicant;
 - (iii) a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public as identified in Section 4.1-4(4), or conflict with existing local laws or ordinances.
- (6) Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece of property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.
- (7) Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry-floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria except 4.4-2(1), and otherwise complies with Sections 5.1-1 and 5.1-2 of the GENERAL STANDARDS
- (8) Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

SECTION 5.0 PROVISIONS FOR FLOOD HAZARD REDUCTION

* 5.1 GENERAL STANDARDS

In all areas of special flood hazards, the following standards are required:

* 5.1-1 Anchoring

- (1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.
- (2) *All mobile homes shall be anchored to resist flotation, collapse, or lateral movement by bracing, piling, tie-downs and frame ties to ground anchors. Specific requirements shall be that:*
 - (i) *tie-downs shall be provided at each corner of the mobile home and at intermediate points along the side;*

* 5.2 SPECIFIC STANDARDS

In all areas of special flood hazards where base flood elevation data has been provided as set forth in Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD or Section 4.3-2, Use of Other Base Flood Data, the following provisions are required:

* 5.2-1 Residential Construction

- (1) New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to or above base flood elevation.
- (2) Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
 - (i) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
 - (ii) The bottom of all openings shall be no higher than one foot above grade.
 - (iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

* 5.2-2 Nonresidential Construction

New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to the level of the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

- (1) be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
- (2) have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
- (3) be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection ~~and satisfied~~ based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 4.3-3(2)
- (4) Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in 5.2-1(2).
- (5) Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building constructed to the base flood level will be rated as one foot below that level).

5.2-3 Mobile Homes

- (1) ~~Mobile homes shall be anchored in accordance with Section 5.1-1.~~
- (2) ~~For new mobile home parks and mobile home subdivisions, lot expansions of existing mobile home parks and mobile home subdivisions, for existing mobile home parks and mobile home subdivisions where the repair/reconstruction or improvement of the streets, utilities, and pads equals or exceeds 50 percent of value of the streets, utilities, and pads before the repair/reconstruction or improvement has commenced, and for mobile homes not placed in a mobile home park or mobile home subdivision, require that~~
 - (i) ~~stahds h/ lds ate elevated h/ compacted fill or on pillars so that the loads floor of the mobile home will be at or above the base flood level~~
 - (ii) ~~adequate surface drainage and access for a vehicle are provided and~~
 - (iii) ~~in the instance of elevation on pillars, that~~

- *Yots/are/late/enough/to/behind/sides.*
- *plumb/foundation/s/are/placed/in/straight/side/of/home/main/10/feet/height/and*
- *reinforcement/is/provided/bt/plumbing/water/heat/gas/line/ground/level.*

- (3) *No/mobile/home/shall/be/placed/in/a/floodway,/except/in/an/existing/mobile/home/park/or/existing/mobile/home/subdivision.*

* 5.2-3 Manufactured Homes

All manufactured homes to be placed or substantially improved within Zones A1-30, AH, and AE shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is at or above the base flood elevation and be securely anchored to an adequately anchored foundation system in accordance with the provisions of subsection 5.1-1(2).

* 5.3 FLOODWAYS

Located within areas of special flood hazard established in Section 3.2 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

- (1) Prohibit encroachments, including fill, new construction, substantial improvements, and other development unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
- (2) If Section 5.3(1) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Section 5.0, PROVISIONS FOR FLOOD HAZARD REDUCTION.

NOTE: Where base flood elevations have been provided but floodways have not, Section 5.3 should read as follows:

5.3 ENCROACHMENTS

The cumulative effect of any proposed development, when combined with all other existing and anticipated development, shall not increase the water surface elevation of the base flood more than one foot at any point.

* Required for approval by FEMA.

Attachment for Shallow Flooding (AO Zones)

REGION X MODEL FLOOD DAMAGE PREVENTION ORDINANCE

December 1986

If the FIRM has AO zones depicting shallow flooding, the following section must be added in order to address the depth designations in these zones, vs. the base flood elevations that are provided in other areas of detailed study. In the model ordinance, this section will appear as either 5.3, 5.4 or 5.5 depending on whether or not the flood data in a particular community includes floodways and/or coastal high hazard areas.

5.4 STANDARDS FOR SHALLOW FLOODING AREAS (AO ZONES)

Shallow flooding areas appear on FIRM's as AO zones with depth designations. The base flood depths in these zones range from 1 to 3 feet where a clearly defined channel does not exist, or where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is usually characterized as sheet flow. In these areas, the following provisions apply:

- (1) New construction and substantial improvements of residential structures within AO zones shall have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, to or above the depth number specified on the FIRM (at least two feet if no depth number is specified).
- (2) New Construction and substantial improvements of nonresidential structures within AO zones shall either:
 - (i) have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, to or above the depth number specified on the FIRM (at least two feet if no depth number is specified); or
 - (ii) together with attendant utility and sanitary facilities, be completely flood proofed to or above that level so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and and hydrodynamic loads and effects of bouyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect as in section 5.2-2(3).
- (3) Require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.

Attachment for Coastal High Hazard Areas (V Zones)

REGION X MODEL FLOOD DAMAGE PREVENTION ORDINANCE

December 1986

If the FIRM has V zones (V1-V30, VE, V) depicting coastal high hazard areas and invoking Section 60.3(e) of the Federal Regulations, two definitions and the following section must be added. In the model ordinance this section will appear as either 5.3, 5.4, or 5.5 depending on whether or not flood data in a particular community includes floodways and/or A0 (shallow flooding) zones.

1. SECTION 2.0 DEFINITIONS. Delete the old definition of breakaway wall and add the following:

"BREAKAWAY WALL" means a wall that is not a part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

"COASTAL HIGH HAZARD AREA" means the area subject to high velocity waters, including but not limited to, storm surge or tsunamis. The area is designated on the FIRM as Zone V1-V30, VE or V.

2. Add the following section for Coastal High Hazard Areas. Note that this is an entirely new section from the original model ordinance attachment. This is because the changes are such that it is almost impossible to mesh the old and the new requirements. For informational purposes, the old coastal flooding attachment is reproduced at the bottom of the second page of this attachment.

5.4 COASTAL HIGH HAZARD AREAS

Located within areas of special flood hazard established in Section 3.2 are Coastal High Hazard Areas, designated as Zones V1-V30, VE and/or V. These areas have special flood hazards associated with high velocity waters from tidal surges and, therefore, in addition to meeting all provisions in this ordinance, the following provisions shall also apply:

(1) All new construction and substantial improvements in Zones V1-V30 and VE (V if base flood elevation data is available) shall be elevated on pilings and columns so that:

- (i) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level; and
- (ii) the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and Water loading values shall each have a one percent chance of being equalled or exceeded in any given year (100-year mean recurrence interval);

A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of (i) and (ii) of this Section.

- (2) Obtain the elevation (in relation to mean sea level) of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures in Zones VI-30 and and VE, and whether or not such structures contain a basement. The local administrator shall maintain a record of all such information.
- (3) All new construction shall be located landward of the reach of mean high tide.
- (4) Provide that all new construction and substantial improvements have the space below the lowest floor either free of obstruction or constructed with nonsupporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purpose of this section, a breakaway wall shall have a design safe loading resistance of not less than 10 and no more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local or State codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions:
 - (i) breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and
 - (ii) the elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each have a one percent chance of being equalled or exceeded in any given year (100-year mean recurrence interval).
- (5) If breakaway walls are utilized, such enclosed space shall be useable solely for parking of vehicles, building access, or storage. Such space shall not be used for human habitation.
- (6) Prohibit the use of fill for structural support of buildings.
- (7) Prohibit man-made alteration of sand dunes which would increase potential flood damage.

- ~~(1) All buildings or structures shall be located landward of the mean high tide.~~
- ~~(2) All buildings or structures shall be elevated so that the lowest supporting member is located no lower than the base flood elevation level, with all space below the lowest supporting member open so as not to impede the flow of water, except for breakaway walls as provided for in Section 5.4(8).~~
- ~~(3) All buildings or structures shall be securely anchored on pilings or columns.~~
- ~~(4) Pilings or columns used as structural support shall be designed and anchored so as to withstand all applied loads of the base flood flow.~~
- ~~(5) Compliance with provisions of Section 5.4(2), (3) and (4) shall be certified to by a registered professional engineer or architect.~~
- ~~(6) There shall be no fill used for structural support.~~
- ~~(7) There shall be no alteration of sand dunes which would increase potential flood damage.~~
- ~~(8) Breakaway walls shall be allowed below the base flood elevation provided they are not a part of the structural support of the building and are designed so as to breakaway under abnormally high tides or wave action, without damage to the structural integrity of the building on which they are to be used.~~
- ~~(9) If breakaway walls are utilized, such enclosed space shall not be used for human habitation.~~
- ~~(10) Prior to construction, plans for any structure that will have breakaway walls must be submitted to the (local administrator) for approval.~~
- ~~(11) Prohibit the placement of mobile homes, except in an existing mobile home park or mobile home subdivision.~~
- ~~(12) Any alteration, repair, reconstruction or improvement to a structure started after the enactment of this ordinance shall not enclose the space below the lowest floor unless breakaway walls are used as provided for in Section 5.4(8) and (9).~~

Superseded